

Applicants: Hirvonen et al.
Application Serial No.: 10/538,193
Filing Date: April 21, 2001
Docket No.: 187-95 PCT/US
Reply to non-final Office Action mailed May 12, 2009
Page 6 of 12

REMARKS

The non-final Office Action mailed May 12, 2009 and the references cited therein have been carefully considered. As a result of this Response, it is respectfully submitted that pending Claims 1-23 are now before the Examiner in condition for favorable consideration and allowance.

A. Claim Rejections under 35 U.S.C. §103

Claims 1-23 were rejected as obvious over U.S. Patent No. 6,188,365 to Mattsson et al. (*Mattsson*) and U.S. Patent No. 3,383,630 to Kuroda (*Kuroda*).

The present invention is directed to an arrangement for testing a radio device, which includes a waveguide and a holder. The waveguide is closed at both of its ends. The holder is arranged to hold the radio device partly inside the waveguide in such a manner that at least a portion of the radiating part of the radio device remains outside the waveguide. The at least a portion of the radiating part of the radio device remaining outside the waveguide is entirely inside the holder. The waveguide includes one or more ridges and one coupling. The ridges extend along a longitudinal axis of the waveguide, and the end of at least one ridge facing the holder is beveled. The coupling is inside the waveguide for transmission and reception of a radio-frequency signal by the use of a wideband mode of propagation, as defined by Claim 1.

The present invention is further directed to a method of testing a radio device wherein the radio device to be tested is mounted by means of a holder such that the radio device is held partly inside a waveguide closed at both of its ends. The method includes generating a wideband mode of propagation in the waveguide by means of at least one ridge. The end of the at least one ridge facing the holder is beveled. The method also includes transmitting and receiving radio-frequency signals by using the wideband mode of propagation between the radio device and a coupling installed in the waveguide. At least a portion of the radiating part of the radio device remains outside the waveguide. The at least a portion of the radiating part of the radio device remaining outside the waveguide is entirely inside the holder, as defined by Claim 17.

The Office Action concedes that *Mattsson* fails to teach a holder arranged to hold the radio device partly inside the waveguide in such a manner that at least a portion of the radiating part of the radio device remains outside the waveguide, wherein the portion of the radiating part of the radio device remaining outside the waveguide is entirely inside the holder. However, the Office Action indicates that *Kuroda* teaches this feature at column 2, lines 21-34 and 41-47. The cited portion of *Kuroda* is as follows:

Referring to each of FIGS. 10 and 11 showing partly cut away perspective views of further embodiments of this invention, another standard waveguide is attached perpendicularly to a device of the kind shown in FIGS. 8 and 9 at the portion of conjunction. With this device, the electromagnetic wave entering at a terminal 10 is transmitted to both terminals 11 and 12 in phase, but not to another

terminal 13 because their electric-field vectors are perpendicular to each other. The electromagnetic wave entering at the terminal 13 is transmitted to both of the terminals 11 and 12 in opposite phase, but not to the terminal 10 because their electric-field vectors are perpendicular to each other. This means that the waveguide combination of FIG. 10 is a novel electromagnetic wave transmission device that serves as a hybrid circuit like a magic tee. The device of FIG. 11 works in principle as that of FIG. 10, differing therefrom only in that the portion ending at the terminals 11 and 12 is formed of separate ridge waveguides.

While the terminal 13 of FIG. 10 is illustrated as a rectangular waveguide, it may instead be formed of a circular waveguide, a ridge waveguide, a coaxial line, or any other electromagnetic wave transmission device for transmitting the electromagnetic wave in any mode, but so arranged as to make the electric-field vectors perpendicular to each other at the terminals 13 and 10.

Thus, *Kuroda* does not teach that the terminal 13 functions as a holder arranged to hold a radio device partly inside the waveguide in such a manner that at least a portion of the radiating part of the radio device remains outside the terminal 13 and the at least portion of the radiating part of the radio device remaining outside the terminal 13 is entirely inside the holder. Specifically, the terminal 13 shown in Figures 10 and 11 is disclosed as forming a transmission device that serves as a hybrid circuit or “magic tee” that directs energy from either terminal 10 or terminal 13 to terminals 11 and 12. If a radio device were to be inserted into the terminal 13, nothing is disclosed in *Kuroda* that would serve to hold or retain the radio device therein. Thus, this feature is wholly undisclosed in *Kuroda*.

Further, each of the terminals 10-13 in *Kuroda* is described as being open, and thus combining the teachings of the cited references in the manner suggested would change the principle of operation in both references. That is, closing the ends of the terminals 10-13 in *Kuroda* (as required at column 3 lines 35-36, 59-62 and shown in Figures 2-6 of *Mattsson*) would prevent the device in *Kuroda* from operating as a “magic tee” (as required at column 2, lines 33-36 of *Kuroda*), which allows electromagnetic waves to enter terminals 10 or 13 and be directed to terminals 11 and 12. Conversely, opening the ends of the waveguides in *Mattson* would make the device in *Mattsson* unsuitable for testing mobile terminals without removing the antenna by inserting the antenna into a hole adapted to receive the antenna, as required at column 1, lines 30-32 and column 3, lines 41-46 of *Mattsson*. This is in direct violation of MPEP §2143.01 (V), which states that if “the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification” (*In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984)), and MPEP §2143.01 (VI), which states that if “the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious” (*In re Ratti*, 270 F.2d 810 (CCPA 1959)).

Claim 2 requires one or more pegs, made from a conductive substance and fastened to the inner surface of the waveguide. The Office Action contends that *Mattsson* teaches such pegs at col. 4 lines 1-6. However, the cited text merely mentions that the end of the waveguide is

“covered by a material 25 that will absorb the power” of the test signal. Neither the text nor Fig. 3 of *Mattsson* or any of the cited references suggest that this material includes a peg. Similar arguments are equally applicable to Claims 3, 4, and 22, which also require pegs.

Further, Claim 4 requires that “one end of at least one peg is fastened to the same wall of the waveguide as one ridge”. Since the embodiment described in the citation from *Mattsson* contains no ridges, *Mattsson* cannot disclose this feature. The Office Action relies on the same text from *Mattsson* in rejecting Claim 6, which involves strips of absorption material. Once again, however, nothing in *Mattsson* would suggest that the material described therein includes a strip of any type.

Regarding Claim 7, the Office Action indicates that *Mattsson* discloses an arrangement “wherein the cross-sectional shape of the holder conforms to the external dimensions of the radio device to be tested and that the length of the holder is selected in a manner preventing radio-frequency radiation from propagating out from the end of the holder opposite to the waveguide” at col. 2 lines 38-46 and col. 3 lines 10-17. However, it is submitted that the cited text merely describes the general dimensions of the waveguide in *Mattsson*, but does not mention any particular method or rationale for selecting the length of the holder. Indeed, neither *Mattsson* nor *Kuroda* suggests a holder of any kind.

It is further submitted that rejection of Claims 8, 9, and 15 is also without basis in that the waveguide in *Kuroda* is not closed but open (Claim 8); *Kuroda* does not teach a holder

Applicants: Hirvonen et al.
Application Serial No.: 10/538,193
Filing Date: April 21, 2001
Docket No.: 187-95 PCT/US
Reply to non-final Office Action mailed May 12, 2009
Page 11 of 12

configured to hold the radio device inside the waveguide such that the antenna part of the radio device is inside the waveguide (Claim 9); and *Kuroda* does not teach a holder that is detachably attachable to the waveguide (Claim 15).

Regarding Claim 13, which describes a holder that includes small openings at the keys of the radio device to be tested, nothing in the cited passage of *Kuroda* would teach or suggest this feature. In fact, the waveguide 13 in Figures 10 and 11 of *Kuroda* makes no provision whatsoever for holding a radio device or any other device. Thus, it is submitted that the disclosure of *Kuroda* is not relevant to the claimed features of the invention discussed above.

Applicants respectfully note that in order to support a claim of *prima facie* obviousness, the cited references must teach or suggest each and every element of the invention, and there must be a basis to combine the references and prior art as suggested. However, nothing in the art of record would teach or suggest, either alone or in combination, each of the elements recited in Claims 1 and 17, as currently amended.

Applicants submit that Claims 2-16 and 18-23, which ultimately depend from Claims 1 and 17, respectively, are patentable over the art of record by virtue of their dependence. Further, Applicants submit that Claims 2-16 and 18-23 define additional patentable subject matter in their own right. Therefore, it is requested that the rejection of Claims 1-23 under 35 U.S.C. §103(a) be reconsidered and withdrawn.

Applicants: Hirvonen et al.
Application Serial No.: 10/538,193
Filing Date: April 21, 2001
Docket No.: 187-95 PCT/US
Reply to non-final Office Action mailed May 12, 2009
Page 12 of 12

Conclusion

Favorable reconsideration of Claims 1-28 and allowance of pending Claims 1-23 are respectfully solicited.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' attorney at the telephone number provided below to discuss any outstanding issues.

Respectfully submitted,

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